

# ANNALS OF SURGERY

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VOL. XLVII

APRIL, 1908

No. 4

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## ORIGINAL MEMOIRS.

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### THE DIRECTION OF THE JEJUNUM IN THE OPERATION OF GASTRO-ENTEROSTOMY.

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THE operation of gastro-enterostomy has undergone a considerable number of alterations since the day on which Nicoladoni first suggested its performance to von Wölfler. There is a general agreement, it would now appear, among all surgeons that the posterior operation is preferable to the anterior, chiefly because it allows of the opening being made into the jejunum close to the duodeno-jejunal flexure, so that the "loop" the cause of such various complications may be avoided. But it is not yet decided as to whether it is better to attach the jejunum to the stomach in such manner that the opening shall be with its long axis vertical, or inclined from above downwards to one side or the other. In the early descriptions I gave of the technique of this operation I suggested that the jejunum should be attached to the stomach along a line obliquely downwards and to the right. By degrees I came to make the opening more and more vertical until now it is usually as nearly vertical as I am able to make it; with an inclination, when there is one, slightly downwards and to the right. In my own hands this operation has given most excellent results. Vomiting, either immediately after, or at some long time after the operation, has been conspicuously

absent. The regurgitation of bile has not been encountered in at least 200 cases dealt with by this method. So much has it been lost sight of that those who have followed my work in recent times have had no experience of it. But this has not been repeated in the practice of others who have carried out what was intended to be an exactly similar procedure. Dr. W. J. Mayo and Dr. Munro of Boston, to name two of the most expert surgeons in gastric diseases, both met with occasional instances of bilious vomiting. To endeavor to find a better method, one in which this tendency to the regurgitation of bile should be eliminated Dr. W. J. Mayo (*ANNALS OF SURGERY*, 1906, i., 537) suggested that the jejunum should be applied with its long axis lying from above downwards and to the left. He pointed out that the jejunum on leaving the flexure passed to the left and backwards to the kidney pouch; when, therefore, the attachment of the bowel to the stomach was made along the line I had indicated a displacement occurred, which might result in a kink of the gut either at the flexure, or at the upper part of the union with the stomach. Though I did not, for reasons which I will presently set forth, agree with the opinion of Dr. Mayo, I felt disposed to perform some operations by the method he described. The results were not by any means so satisfactory as those to which I had happily become accustomed. In three cases in all I found that bilious vomiting occurred; in two of them it was slight; in the third it was considerable, bile was vomited in large quantities frequently. This was indeed the worst case of regurgitation I had seen since the days of my very early experience. The anastomosis was made in this instance as close to the flexure as possible, and it lay exactly along the line depicted by Dr. Mayo. My experience of this untoward complication was not singular. Mr. Rutherford Morison had the like ill-fortune, and I have heard of others. Clearly therefore there was some other factor than the mere direction of the jejunal attachment which must be held responsible. And I was much puzzled to discover what it was. Recently I had the opportunity of seeing the post-mortem

examination of the case in which regurgitant vomiting had occurred and it revealed the cause of the trouble. Death occurred with jaundice, ascites and emaciation, the cancer of the pylorus, for which the original operation was performed, having spread to the liver. When the parts were examined the jejunum was seen to be attached very close to the flexure along Mayo's line, and from the anastomosis the gut passed downwards and to the left into the kidney pouch; it was free from adhesions throughout. But between the flexure and the anastomosis a distinct twist was seen in the jejunum. It was as though the bowel before being applied to the stomach had been rotated around its longitudinal axis. The amount of the twist was small, but quite perceptible; and it was of course more appreciable since it was confined to that portion of the gut, just about one inch in length, which lay between the flexure and the uppermost point of the sutured line. When the anastomosis was separated, the opening in the jejunum was seen to be not exactly opposite the line of attachment of the mesentery. The rotation of the jejunum around its longitudinal axis, the flexure of course being fixed, had, I make no doubt, been ample to cause that partial obstruction of the gut that was responsible for the vomiting of bile. I think it more than probable that the same condition must have existed in those cases, related by Dr. Mayo and Dr. Munro, in which vomiting followed the application of the jejunum to the stomach along the line from above downwards and to the right.

In his paper Dr. Mayo considers that the normal direction of the jejunum as it leaves the flexure is downwards and to the left, to the kidney pouch. That the bowel lies often in this position when the parts are examined post-mortem, or when the abdomen is opened with the patient in the customary position during life, is true. But seeing that the flexure lies to the left of the vertebral body it is into this position that the bowel would naturally fall. If, however, the patient's position be altered by turning him to one side or the other and the abdomen be then opened the jejunal direction will be found

to vary accordingly. The attachment of the jejunum at the flexure is of such a nature as to allow it to go to left or right with equal ease, and with equal freedom from kinking at the meeting of the fixed end and the mobile parts. The value of the little suspensory ligament or meso-colic band in preventing any kink is perhaps not inconsiderable. That is, not improbably, its sole purpose. To say that the jejunum takes a certain line "normally" from the flexure is therefore probably neither accurate, nor reasonable. Its direction varies in accordance with the position of the individual, and in each position there is an easy transmission of fluid along its lumen. Were it not so we might suffer high intestinal obstruction as a result of sleeping on the right side at night. It is, of course, not very infrequent to find the jejunum pulled over to the right either by a long meso-colic band, or by adhesions between the jejunum and the transverse meso-colon. So far as my own experience goes, when the jejunum is adherent to the meso-colon it is always fixed on the right of the flexure and never on the left. If then any position may be assumed by the first few inches of the jejunum the mere direction of the line of attachment of the jejunum to the stomach is probably not the point of chiefest consequence in gastro-enterostomy. And I have no doubt that every surgeon has at times made an anastomosis with whose appearance he has been considerably displeased, and he has feared that troubles would ensue. This has, not once only, been my experience after the operation of partial gastrectomy. That the line of union which points from above downwards and to the right may be followed, in a long series of cases in succession without the slightest mishap my own cases show. That the line almost at right angles to this may be equally successful Dr. Mayo has proved. I suggest therefore that, as one might naturally suppose, one line is probably as good as another or any line between them as good as either, provided always that no twist be given to the gut at the time the anastomosis is made. Just as there is no "natural direction" of the jejunum, so there is no "best line" for the anastomosis; so far at least as the

mechanics of the operation are concerned. But my own choice for some time past now has been in favor of the vertical line; and since many of us spend most of our time in positions other than the recumbent one, this is probably the most frequent direction taken by the jejunum as it passes from its point of origin. The essential point, it seems to me, then, is to choose not so much a special line upon the stomach, along which the jejunum should be applied, but to choose on the jejunum as close to the flexure as possible, a line which can be directly approximated to the stomach without the gut being revolved around its longitudinal axis.